DOCUMENT RESUME

SP 004 713

ED 050 011

AUTHOR Metzner, Seymour; Sharp, Richard M.
TITLE Preference Patterns of Education Students in Pass-Fail Electives.
PUB DATE Feb 71
NOTE 7p.; Paper presented at AERA annual meeting, New York, 1971

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS Academic Education, *Education Majors, *Elective Subjects, Mathematics, *Pass Fail Grading, Science Courses

ABSTRACT

This study investigated whether pass-fail elective options at the undergraduate level will encourage education majors to break away from previous patterns of elective choice and choose more courses in various scientific and mathematical disciplines. Two hundred sixty-three education students at Queens College of the City University of New York were identified as electing pass-fail option courses. Analysis of these choices revealed that only 14 students elected courses in scientific or mathematical areas, thus leading to the conclusion that the institution of pass-fail options holds little promise for developing greater scientific or mathematical sophistication among prospective teachers. (Author/RT)

ED050011

Preference Patterns of Education Students in Pass-Fail Electives

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

Seymour Metzner
Learning Resources Center

Richard M. Sharp
San Fernando Valley State College

The Fifty-Fifth Annual Meeting

American Educational Research Association

February 4-7, 1971

New York City

SP004713

Preference Patterns of Education Students in Pass-Fail Electives

Seymour Metzner
Learning Resources Center

Richard M. Sharp
San Fernando Valley State College

One of the major problems plaguing education has been the lack of proficiency of teachers and education students in subject areas they are obliged to teach. This is particularly true regarding the mathematical and scientific proficiency of elementary education teachers and prospective teachers. Studies by Hardin (1965), Kleinman (1966), Uselton (1962), and Verrill (1961) in science and Carroll (1961), Orleans and Wandt (1953), Sparks (1961) and Williams (1966) in mathematics reveal that teachers and education students typically achieve only at junior high or high school levels and are seriously deficient in basic understandings in both disciplines. Two likely reasons for this situation relate to the type of courses usually taken by education students and, conversely, the type courses which are consciously avoided.

Science courses taken by education students tend to be general survey courses or "methods" courses rather than specific content courses such as solid state physics or biochemistry (Bryant, 1963; Moser, 1964). When they do take specific courses, these tend to be highly concentrated in biology (Richardson, 1960; Rosen, 1960). Even when students do take science subjects, instructors feel instructing them is particularly difficult due to the students poor background in these disciplines (Lerner, 1964). As a result, Auletto (1955) and Wytiaz (1962) found that a majority of the teachers they surveyed felt inadequately prepared to teach science. The importance of adequate preparation is underlined by Victor's (1962) finding that teachers with the poorest preparation in science devote the least time to it in class and do experiments or demonstrations less often than better prepared teachers.

The mathematics preparation of prospective elementary teachers also leaves much to be desired. Despite the recommendation by the Committee for Undergraduate Preparation in Mathematics (CUPM) that 12 semester hours in mathematics content courses are necessary for the proper understanding of mathematics, few teachers get significantly more than one-third this recommended minimum (Fisher, 1967; Garstens, 1965).

The lack of teacher preparation is not happenstance or unfortunate coincidence but is the result of consistent, planned avoidance of science and math courses whenever possible. This by-passing syndrome starts in high school and continues into college (Mallinson and Sturm, 1955; Stanley, 1959). Despite their obvious need for more mathematics courses, inservice courses taken by teachers are almost never in solid, content-oriented mathematics courses (Creswell, 1967). Smith and Peckham (1961) found that, at a representative state college, only 2% of the education students took science or mathematics as freely chosen electives. The most popular fields were the social sciences, education, humanities, and fine arts.

It is almost universally accepted that students avoid particular courses and fields in colleges not simply through dislike but rather because, for one reason or another, they fear they will get a poor grade that will lower their grade point average and possibly work against their acceptance at a graduate school. The advent of pass-fail courses was supposed to lessen this fear and encourage taking of courses which might otherwise be avoided. This in turn, should lead to more fully developed and well-balanced programs. There is ordinarily a limit to the number of pass-fail courses one may elect, typically not more than one per semester, and it is usually required that the courses so elected be outside the students major field.

Objective

This study sought to determine whether education students, in pass-fail elective options, chose courses that extended their horizons in the scientific and mathematical fields they have previously avoided. It also sought to determine whether sex differences played a significant part in these choices.

Method

A survey was made of all classes at Queens College of The City University of New York to determine which students majoring in education were participating, on a pass-fail basis, in 40 areas of concentration covering most of the traditional disciplines and studies to be found at a major university. The science areas included were biology, chemistry, geology, and physics. A chi square analysis of choice by sexes was planned to determine the significance of any trends in this area.

Results

There were 753 students, all but six of whom were juniors or seniors, taking courses on a pass-fail basis. Two hundred sixty-three were education majors, 41 male and 222 female students. As Table 1 shows, only 14 of the 263 education students elected any classes in the areas of biology, chemistry, geology, physics, or mathematics. This massive disregard of these scientific disciplines by both sexes made any planned chi square analysis a pedantic exercise in statistical irrelevance. Since neither group freely participated in science or mathematics courses to any degree even approaching meaningful educational significance, any further treatment of the data was cancelled as meaningless regardless of whether statistical differences between sexes could or could not be found. It may be noted that over half the students (140), elected courses concentrated in the social sciences, or psychology, with various fine arts courses following in popularity. This pattern closely follows the freely chosen electives commonly taken by education students under regular grading practices.

Conclusions

The research review opening this study substantively documented the lack of teacher competence in scientific and mathematical disciplines. It also revealed a pattern of course avoidance in these areas extending from high school through college. Postulating that the way to help overcome this course avoidance is by means of pass-fail electives, may be theoretically sound but is empirically unjustified. The results of this study at Queens College strongly suggest that education students will not opt for scientific or mathematically oriented courses on a free elective basis regardless of the grading system used. Considering that the students of Queens College were admitted via some of the most academically rigorous selection procedures of any college in the country, they constitute a highly selective group of unusually strong intellect and aptitude. If the pass-fail option does not encourage them to take science and mathematics courses, it is highly unlikely that any strikingly dissimilar picture would emerge at less selective institutions.

One must conclude that, insofar as education students are concerned, pass-fail electives do not radically alter previous choice patterns in elective courses nor hold much promise for augmenting the scientific and mathematical sophistication of these students. Other paths toward these ends will have to be explored.

TABLE 1

Pass-Fail Elective Choices of Male and Female Education Students

Course	Education Students Male	Female
Anthropology-Sociology	2	51
Art	0	12
Biology*	0	3
Chemistry*	0	1
Chinese	0	0
Classics	1	0
Comparative Literature	0	7
Contemporary Civilization	0	2
Drafting	0	0
Economics	4	4
Education	0	1
English	2	4
French	4	1
Geography	0	0
Geology*	0	2
German	1	4
Greek	0	0
Hebrew	0	2
History	4	12
Home Economics	1	13
Honors	0	0
Italian	2	0
Latin	0	4
Linguistics	0	0
Mathematics*	1	7
Music	4	15
Oriental Studies	0	0
Philosophy	3	13
Physical Education	1	2
Physics*	0	0
Political Science	4	4
Portugese	0	0
Psychology	5	50
Russian	1	1
Spanish	0	0
Speech	0	0
Swedish	0	0
Communications Arts Studies	1	7
Comparative Languages	0	0
Total	41	222

*Science or mathematics areas

REFERENCES

Auletto, John X. The teaching of science in the public elementary schools of Delaware. Unpublished doctoral dissertation. Temple University, 1955.

Bryant, Paul P. "Science requirements for elementary school teachers in colleges for teacher education." Science Education 47:475-82, December, 1963.

Carroll, Emma C. A study of the mathematical understandings possessed by undergraduate students majoring in elementary education. Unpublished doctoral dissertation. Wayne State University, 1961.

Creswell, John L. "How effective are modern mathematics workshops?" Arithmetic Teacher 14:205-208, March 1967.

Fisher, John J. "Extent of implementation of CUPM level I recommendations." Arithmetic Teacher 14:194-97, March, 1967.

Garstens, Helen. "Some trends in the mathematical training of elementary school teachers." CUPM Report #11, Mathematical Association of America, April, 1965.

Hardin, Henry N. An analysis of selected aspects of the science preparation of prospective elementary teachers at the University of Miami. Unpublished doctoral dissertation. University of Miami, 1965.

Kleinman, Gladys S. "Progress of an experimental inservice institute in science for elementary school teachers in grades K-6." Science Education 50: 136-40, March, 1966.

Lerner, Marjorie S. An investigation of the status of the methods course in elementary school science in selected teacher training institutions. Unpublished doctoral dissertation. Northwestern University, 1964.

Mallinson, George G. and Sturm, Harold E., "The science backgrounds and competencies of students preparing to teach in the elementary school." Science Education 39:398-405, December, 1955.

Moser, Gene W. The post-secondary science training of one thousand nine hundred and forty-five New York State elementary teachers. Unpublished doctoral dissertation. Cornell, 1964.

Orleans, Jacob and Wandt, Edwin. "The understanding of arithmetic possessed by teachers." Elementary School Journal 53:501-507, May, 1953.

Richardson, Evan C. Proposals for improvement of science teaching in New Jersey elementary schools. Unpublished doctoral dissertation. Rutgers - The State University, 1960.

Rosen, Sidney. "Science backgrounds of elementary teachers." Illinois Education 48:378-79, May 1960.

Smith, Bernice and Peckham, Dorothy. "Elementary education majors know how to teach and what to teach." California Journal of Education 29:195-201, May, 1961.

Sparks, Jack N. "Arithmetic understandings needed by elementary school teachers." Arithmetic Teacher 8:395-403, December, 1961.

Stanley, Julian C. "Physics and chemistry courses taken by prospective elementary teachers." Journal of Teacher Education 10:392-93, September, 1959.

Uselton, Horace W. Factors related to competence in science of prospective elementary teachers. Unpublished doctoral dissertation. University of Wisconsin, 1961.

Verrill, John E. The preparation of general elementary teachers to teach science. Unpublished doctoral dissertation. University of Wisconsin, 1961.

Victor, Edward. "Why are our elementary school teachers reluctant to teach science?" Science Education 46:185-92, March, 1962.

Williams, Ralph Curtis. Teacher preparation in mathematical arithmetic. Unpublished doctoral dissertation. University of Southern California, 1966.

Wytiaz, Patricia L. "A study of attitudes of fifth-grade teachers of Cumberland County, New Jersey toward science and their preparation for teaching it in the elementary school." Science Education 46:151-52, March, 1962.